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Day 2: Thursday, 18 August 2005: Colorado Native Aquatic Species Restoration Program

Dave Schnoor

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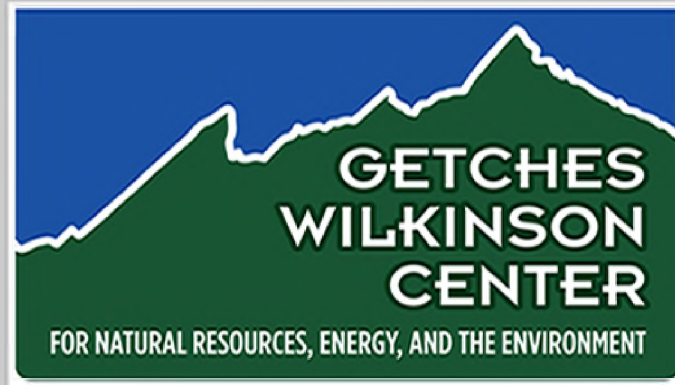
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*Colorado Native Aquatic Species Restoration
Program
Glenwood Springs*

*Discussion of State program to breed and release threatened and endangered aquatic species
into Colorado's rivers and streams*

Presenter:

• **Dave Schnoor, Colorado Division of Wildlife**

Dave Schnoor is Hatchery Manager for the Division of Wildlife Native Aquatic Hatchery and Species Restoration Facility. The Hatchery is the first state facility nationwide built exclusively for Native Species, and has produced one state listed Threatened and Endangered amphibian (Boreal toad), two Federally listed Threatened and Endangered fish (Colorado pikeminnow and Bonytail chub), and ten species of state listed Threatened and Endangered fish. Within the Division of Wildlife, Dave has also managed the Wray Hatchery and the Las Animas Fish Hatchery. Prior to joining DOW, Dave managed two private fish hatcheries in Illinois and Oklahoma, and worked on a variety of projects as a Researcher at the Southern Illinois University Fisheries Lab. Dave holds both Bachelor (Wildlife) and Masters (Fisheries) degrees in Zoology from Southern Illinois University. He is a member of Phi Kappa Phi, Phi Beta Kappa, the Zoology Honor Society, and has published in both the US and abroad.

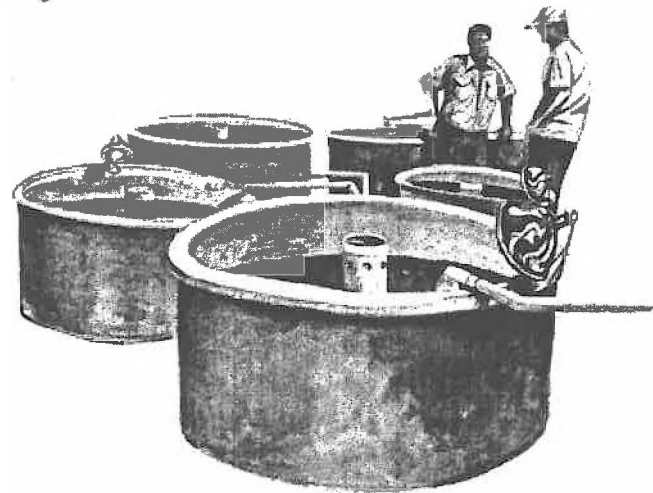
Reading:

Saving Suckers, Dancing with Dave, Colorado Division of Wildlife, Fall 2003.

Saving Suckers, Dancing with Dace



It's not a flashy place, this modest collection of buildings set on the arid, open country of the San Luis Valley near Alamosa. But the John W. Mumma Native Aquatic Species Restoration Facility, more easily known by its acronym NASRF, houses a treasure. Its walls shelter the rare and valuable — brood stock of Colorado's threatened and endangered native fish as well as a unique species of toad that dwells in the state's highest reaches.



These fish won't make a flyfisherman's pulse race, break records for size or beat out tropical fish for color. But they are key to preserving the wildlife heritage of Colorado's streams and rivers, and to preserving the state's power of self-determination in management of its waters and waterways.

Thirteen native species—12 fish and one toad—inhabit a collection of tanks, ponds and aquaria at this Colorado Division of Wildlife (DOW) facility. Three of them are Colorado River fishes on the federal endangered species list. Colorado pikeminnow and bonytail are spawned at the federal hatchery in Dexter, New Mexico, and shipped to NASRF as fry—hatchling fish. They are reared to lengths of five inches and eight inches, respectively, then released into the wild. There are a few endangered razorback suckers, but they are no longer reared here. "We use them to keep the ponds clean," says facility manager Dave Schnoor. The bottom-feeding fish are "like little Hoovers", vacuuming up algae and other detritus. NASRF has had good success rearing another Colorado River inhabitant, the roundtail chub, which is not on the federal list but is classified in Colorado as a species of special concern.



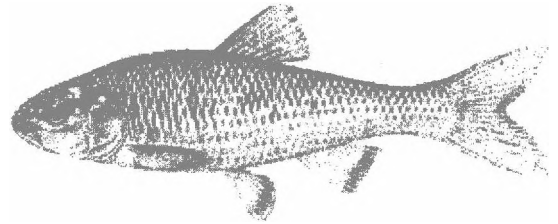
Also thriving here are Rio Grande chub—45,000 fry will be released in 2003—but Rio Grande suckers have been another story. Only when the staff tried to cultivate the species did they discover the sucker's narrow

requirements for water quality, pH and food. "It's been a challenge, but now they're very healthy and spawning," says Schnoor. "Last year we got eggs to hatch, but now we're having trouble getting the fry on feed. There's something we're missing in that little window between swimup and getting on feed. Every single step has had some challenge to it."

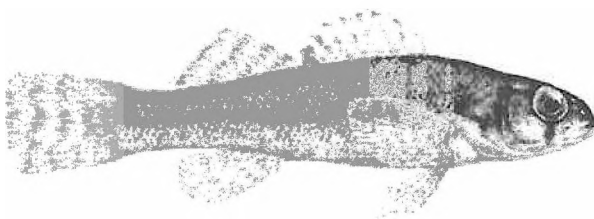
Offering particular challenges are several species of minnows collected from streams and rivers of the Front Range and Eastern Plains. Few people have ever heard of Arkansas darters, common shiners, or plains or suckermouth minnows, though they may have seen them over the years darting in the shallows of streams and ponds. Then there are southern redbelly dace and northern redbelly dace, nicknamed "serbs" and "nerds" by the staff for the shorthand "srbd" and "nrbd" used to label the tanks.

Rearing fish in hatcheries is no new endeavor for the DOW, but most of the species at NASRF have never before been propagated. "They're not a hatchery product," says Schnoor, "we have to do a lot of experimentation to keep them alive, get them to spawn, incubate the eggs, and to rear fry".

Instead of the raceways full of sleek-bodied trout that are familiar at other state hatcheries, the NASRF boasts rows and rows of glass aquaria—250 in all—that give it the look of a pet store. Another 80 round and rectangular tanks that look like large laundry tubs, and eight outdoor ponds, house more fish. Many of them will grow to be no larger than two to five inches, meaning techniques and equipment developed for propagating sport fish must be greatly modified. Even conventional aquaculture terms like "fingerling", meaning a growing fish about as long as a finger, can't be used, since these animals may be less than finger-sized when full-grown.



Keeping the fish in aquaria requires an intensive feeding and cleaning regime that is different for each species. Each also has its own nutritional requirements. Just learning what to feed them has been an enormous task. "We go to the aquarium store and buy everything on the shelf," says Schnoor, "grind it up in a mix and feed it to see what works." Even then, "most of the fry (of the minnows) are too small to eat the brine shrimp that is a mainstay in hatchery culture for fish that are hard to feed." Presently they are fed rotifers (a microscopic life form), but first the staff must raise algae to feed the rotifers.

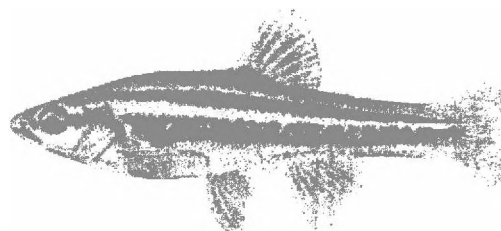


After food comes another hurdle—reproduction. Common techniques used to increase spawning in sport fish, such as squeezing them by hand to strip the ripe eggs, might kill these goldfish-sized minnows. But inciting these captive fish to spawn has been a challenge. By pasting pictures of colorful males to the side of

the aquarium, they've triggered male Arkansas darters into breeding colors for spawning. They've adjusted water temperature, lighting, even tried hormones. "It must be timed almost exactly right to get healthy eggs," says Schnoor, "too early, no eggs; too late, the eggs are too ripe." And injecting a three-inch fish without injuring it is tricky.

Then there are the boreal toads. The unblinking eyes of dozens of toads gaze from long Fiberglas raceways that have been modified with incurving rims to keep them from climbing out. Other tanks are filled with fat black tadpoles, some sprouting two or four legs. Boreal toads, which live at higher altitudes than any other amphibian in Colorado, underwent a mysterious die-off several years back. A fungus is the likely culprit. Propagating the toad has not been particularly hard—nearly 16,000 will be released in 2003—but finding safe, fungus-free ponds to receive them has been.

Schnoor praises his staff for their energy and ingenuity in caring for their challenging charges. "We've got a tremendous crew," he says. "They're very diligent on watching the fish to see what's going on."



The idea of a hatchery dedicated to native fish had been germinating within the DOW since the mid-1980s. By 2000 it became a reality. Support for the facility is broad-based. Of the \$6 million required to purchase the property and construct the buildings, \$1 million came from the Great Outdoors Colorado Trust Fund (GOCO), which continues to contribute for operations and maintenance. The Colorado Water Conservation Board gave \$2 million, and the DOW \$3 million.

After just one year in business, NASRF achieved a milestone—re-stocking bonytails, Arkansas darters and southern redbelly dace in their native waters. In 2003 they will release fry of all but three of the fish they're working on, plus tadpoles, toadlets and adult boreal toads. Plains and suckermouth minnows and Rio Grande suckers aren't yet producing releasable fry.

What is the greatest success story so far? "Numbers-wise," says Schnoor, "it's Rio Grande chub and roundtail chub. Rio Grande sucker has had the most success in terms of overcoming challenges. They have such stringent requirements, it's a challenge just getting them to survive."

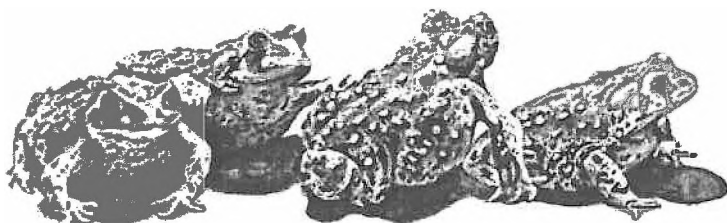
Why go to so much effort and expense for suckers and minnows, species considered worthless by many people? First, explains Schnoor, these species, however small or unattractive, are part of the ecosystem. "They're here for a reason. We don't know the key to the environment, but it's best not to lose them if we don't have to."

Species	Status	Spawned at NASRF	Projected Number for 2003 Release	Size at Release
Arkansas darter	ST	Yes	3,500	1"
Bonytail	SE, FE	No	4,885	8"
Boreal toad	SE	Yes	13,838 tadpoles 2,000 metamorphs	na
Colorado pikeminnow	SE, FE	No	1,000	5"
Common shiner	ST	Yes	5,000	2"

Northern redbelly dace	SE	Yes	200	1"
Plains minnow	SE	Yes (none to date)	na	na
Rio Grande chub	SC	Yes	45,000	2"
Rio Grande sucker	SE	Yes (none to date)	na	na
Roundtail chub	SC	Yes	5,000	2"
Razorback sucker	SE, FE	No	575	5"
Southern redbelly dace	SE	Yes	1,000	1"
Suckermouth minnow	SE	Yes (none to date)		na
SE - Colorado State Endangered		ST - Colorado State Threatened		
SC - Species of Special Concern		FE - Federally Listed Endangered		

The second reason is pragmatic. "The Endangered Species Act says we will attempt to recover these fish and keep them from going extinct," explains Schnoor. "Our goal at this facility is to keep the native fishes of Colorado from being listed federally as threatened or endangered." The restrictions imposed with federal listing would greatly affect use of the state's waterways, says Schnoor, restricting water use for irrigation, urban expansion, recreation and other demands. "This is a sleeping giant that could really impact life in Colorado," he adds. Luckily, Colorado is ahead of the curve in trying to recover its native aquatic wildlife. "We've inventoried what's out there, brought them in, are working with them", says Schnoor. "The key is that there are still enough of them in the wild so we can learn what to feed them, how to raise them, then figure out how to spawn them and then release the young."

There are several federal hatcheries rearing endangered fish, but NASRF is the only state-run facility in the country working on them. These efforts, says Schnoor, will allow Coloradans to continue to raise crops, have land and recreate. "This will keep the waters open that people like to fish in, even if they're not fishing for these animals." Schnoor definitely feels a sense of personal mission in his work. "I'd be in intensive care if there were only 12 of one of these fish left, and I let them die. If my life can make a difference, the mission's here, to keep these guys from becoming extinct. We have the capability to do it, it's just a matter of keeping the opportunity."



Colorado's Wildlife Company bids farewell to Bob Hernbrode, this publication's Big Kahuna since the inaugural issue in 1989, who is retiring from the Division of Wildlife after 27 years. Bob, we will miss your wisdom and guidance.

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